

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

A. PREAMBLE

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Particular Conditions, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. The rates and prices bid in the priced Bill of Quantities shall, except insofar as it is otherwise provided under the Contract, include all Constructional Plant, labour, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.
4. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of Items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.
5. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
6. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
7. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Engineer in accordance with Sub-Clauses 13.4 and 13.5 of the General Conditions except with respect to DAAB Fees and Expenses for which no instruction will be required from the Engineer.
8. The method of measurement of completed work for payment shall be Admeasurement in accordance with ICE Conditions of Contract measurement clauses.



UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	KABUGI IRRIGATION SCHEME	
	GRAND SUMMARY	BoQ
Bill No.	Description	Amount (KSh)
1	Preliminaries and General	
2	Head Works (Collection Chamber)	
3	Solar Pump and Conveyance pipeline	
4	Main Pipelines	
5	Sub Main Pipelines	
6	Secondary Pipelines	
7	Plot Hydrants	
	Sub-Total	
	GRAND TOTAL	



UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No .1- PRELIMINARY AND GENERALS						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Kshs)	AMOUNT (Kshs)	Technical Specifications Ref.
1.1	Contractor's Camp					
1.2.1	Provide for establishment, mobilization and demobilization of the Contractor's camp together with all the required equipment	LS	1			Spec. 1.13-1.17
1.2	Signboards					
1.2.1	Supply, Erect and maintain project signboards in accordance with the Specifications.	No.	3			Spec 1.19.8
1.3	Testing of the works & Pipeline System					
1.3.1	Provide for testing of the system upon completion of the irrigation works	LS	1			Spec 5.17
1.3.2	Undertake Water quality test prior to handing over of the project & Carry out Post Hand over Satisfaction Survey	LS	1			Spec 5.18
1.4	Cost for Adjudication					
1.4.1	Adjudicator Fees for 5 meetings at the rate of 17,000 per hour for 4.5Hours per day litigation of legal disputes.	Days	5			
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 2 - INTAKE WORKS-FOR GRAVITY FED SYSTEM						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
2.1	INTAKE CHAMBER REHABILITATION WORKS					
2.1.1	12 mm (minimum) two-coat plaster; 9 mm first coat of cement and sand (1:6), 3 mm second coat of cement and lime putty (1:10); steel trowelled smooth to:	m ²	20			Spec 3.7
2.1.2	Provide all materials and construct inspection cover, with locking mechanism, for intake chamber.	Item	1			Spec 4.24
2.1.3	Provide, lay, joint and test inlet pipes and fittings, including scour and overflow fittings; Rates to include for all jointing materials, cutting, wastage and anchorage.	Item	1			Spec 5.9
2.2	Intake Chamber pipework					
	<i>The rates inserted should cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.</i>					
2.2.1	160mm dia sluice valve with long detachable spindle and handwheel	No.	1			Spec 4.13.2
2.2.2	160mm dia double flanged GI pipe piece 500mm long with paddle flange welded 150mm from plain end.	No.	1			Spec 4.3
2.2.3	160/ 160mm dia V/J stepped couplings	No.	1			Spec 4.4
2.3	Water Meter Chamber					
2.3.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 750mm . Rates to include for all thrust blocks, pipe supports, inspection covers etc as detailed in the drawings.	No.	1			Spec 4.21
2.3.2	Provide, handle, install and test water meter to fit 160mm steel pipe.	No.	1			Spec 5.17
2.4	Fencing of the Dam					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

2.4.1	Fence comprising of 2000mm high chain-link (Gauge 12), 7 strands of 16-gauge barbed wire, concrete posts at 3.0 m center to center size 100 x 100 x 3200 mm overall length with 600mm cranked top, concrete strainer posts at 24.0 m centers size 100 x 100 x 2800 mm overall length, concrete corner posts are required and 500 x 500 x 500mm concrete class 20 bases for all concrete posts; all as detailed in the attached drawing. Rates to include clearing, excavation works, anchoring of the posts with concrete and installation of the chain-link	m	800			Spec 1.6.1
	<i>Supply, assemble and fix the following purpose made welded mild steel casement gates complete with all necessary ironmongery, handles, lever or finger pulls and pins; and building lugs to jambs and reveals, bedding frames in waterproof cement mortar, including priming with one coat of red oxide primer, including all necessary coupling mullions, transoms and clear glazed fanlight over and jointing in approved mastic externally; applying two coats of black paint</i>					Spec 1.6.1
2.4.2	6000 X 2100mm High double leaved mild steel gate fabricated from 50 X50 X 4mm thick rectangular hollow section mild steel framing all round. 50 X 25 X 3mm thick rolled hollow section mild steel vertical intermediate frames at 480mm centres, 20 X 20 X 3mm thick square hollow section mild steel vertical infill at 130mm centres, mild steel spikes welded to top frames heads and spear circular decorative features 16mm diameter mild steel bars; sides panels and 200mm wide middle panel fabricated from 14mm gauge mild steel sheet metal welded onto framing; door supplied with iron monger viz heavy duty hinges, padlock hasp and staple, padlock, bolt etc pinning gate with one coat of red oxide primer before delivery to site . Hanging gate to position and applying two coats of black paint	No	1			Spec 1.6.1
2.5	Construction of Silt Trap					
	Site Clearance					
2.5.1	Clear site including removal and disposal of all debris, clearance of all growths, bushes, hedges, trees and stumps and grubbing up of roots.	m²	4225			Spec 2.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Excavation and Backfilling					
	<i>Excavation shall include for trimming, levelling, strutting, compacting, stabilizing excavated surfaces and keeping excavations free of water by bailing out, pumping or other means and preparation of the excavated surfaces. The volume of works is to a maximum of the quantity provided.</i>					
2.5.2	Excavate 15,000cum in normal soil for silt-trap measuring 65m x 65m internal dimensions and a depth not exceeding 4m, with side slopes of 1:1, and cart away or stock-pile for re-use as directed by the Engineer.	m ³	15000			
2.6	SPILLWAY REHABILITATION					
	Protection Works					
	<i>Provide and place the following concrete mixes including all form-work.</i>					
2.6.1	Mortared (1:3 cement/sand) stone pitching protection 250 - 300mm to sides (1.5m high) of spillway channel for a distance of up to 80m downstream as directed by the Engineer.	m ²	250			
2.6.2	Concrete grade 20/20 for spillway end-sill.	m ³	1.5			Spec 3.2.3.1
2.6.3	Provide Sufficient PPEs (High Visibility life jackets, life lines & Ring Floaters), first aid tools, traffic management, community H&S plan during the construction of Intake Works for Gravity System	Lumpsu m	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No.3 - Solar Pump and Conveyance Pipeline						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
3.1	Valve Chambers					
3.1.1	Excavate, provide all materials and construct complete valve chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports.	No.	2			Spec 2.11
	<i>Rates to cover supplying of fittings including all jointing accessories, handling, fixing, jointing and testing.</i>					
	Pipework					
3.1.2	DN2160epoxy coated, cement lined steel rising main with flanges to BS4504. The pipework to terminate the connection with the inlet pipe at inlet chamber.	m	150			Spec 4.8.2
	Pipework for Mainlines 1 and 2 offtakes					
3.1.3	160/160mm dia HDPE-U / GI stepped coupling	No.	1			Spec 4.4
3.1.4	160 mm dia single flanged GI pipe (0.5 m long)	No.	1			Spec 4.3
3.1.5	160m x 90 mm dia all flanged tee	No.	1			Spec 4.3
3.1.6	160 mm dia double flanged sluice valve	No.	2			Spec 4.13.2
3.1.7	90 mm dia single flanged GI piece (0.5 m long)	No.	1			Spec 4.3
3.1.8	90mm dia double flanged sluice valve	No.	1			Spec 4.13.2
3.1.9	9090 mm GI / HDPE-U stepped coupling	No.	1			Spec 4.4

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

3.1.10	Supply and install 150mm non-Return valve	No.	1			Spec 4.16.1
3.1.11	160 mm dia Double flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
3.2	Solar Pump					
3.2.1	Supply and install Dayliff 95-10 Pump End, 45Kw	No.	1			Spec 7.1
3.2.2	Supply and install DSM 45KW Pump, 45kW 3PH 8" Sub motor	No.	1			Spec 7.1
3.2.3	Supply and Install Floating Pontoon Structure for submersible Pump	No.	1			Spec 7.2
3.3	Cables					
3.3.1	Supply and install 50mm PVC Flat Submersible Drop Cable	m	170			Spec 7.5
3.3.2	Supply and install 50mmx4 U/G Cable	m	170			Spec 7.5
3.4	Electrical Connections					
3.4.1	Supply and install SV 45kW 3PH Sunverter	No.	1			Spec 7.3
3.4.2	Supply and Install Trina 620W 49.6 VOC Monocrystalline Solar Panels	No.	96			Spec 7.4
3.4.3	Supply and install 620W (26-40No) Galvanized Steel 3M Ground Mount	No.	59,400			
3.4.3.1	Undertake mechanical properties test that evaluates yield point, tensile strength and elongation percentage for Galvanize Steel. The test ultimately indicates the maximum load the material can bear before failure	No.	1			
						Spec 7.5
3.4.4	Supply and install 6mm 2x1 solar PV Black Cable	No.	150			
3.4.5	Supply and Install PV1000/463A 4ST PV disconnect switch	No.	2			Spec 7.5

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

3.4.6	Supply and install PV Protect 1000VDC 125A	No.	2			Spec 7.5
3.4.7	Supply, test and install Earth Rod C/W Clamp 5/8*4FT	No.	4			Spec 7.5
3.4.8	Supply, Test and Install Lightning Arrestor	No.	2			
3.4.9	Supply, Test and Install Copper Earth Cable 10mm	No.	40			Spec 7.5
3.4.10	Supply, Test and Install Enclosure 1000*500*350mm	No.	1			Spec 7.5
3.4.11	Supply and install heat shrink joint (10-35mm)	No.	1			Spec 7.5
3.5	OCCUPATIONAL HEALTH & SAFETY					
3.5.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Conveyance Pipeline 1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

BILL NO. 4 - MAIN PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 4-1 Pump Mainline 1	
2	Bill No. 4-2 Pump Mainline 2	
3	Bill No. 4-3 Conveyance 1	
3	Bill No. 4-4 Conveyance 2	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 4-1 - Pump_ Mainline 1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
4.1.1	Site Clearance and Setting Out					
4.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1078			Spec 2.2
4.1.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
4.1.2.1	Excavate for include for supply and fixing of indicator posts for water main route.	Nr	40			Spec 1.5.1
4.1.2.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	862			Spec 2.9
4.1.2.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	259			Spec 2.9
4.1.2.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	172			Spec 2.9
4.1.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.1.3.1	OD 90 mm HDPE pipes, PN 6	m	380			Spec 4.12.1
4.1.3.2	OD 63 mm HDPE pipes, PN 6	m	320			Spec 4.12.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.1.3.3	OD 40 mm HDPE pipes, PN 6	m	378			Spec 4.12.1
4.1.4	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
4.1.4.1	OD 90 mm Plain ended 45-degree bend	No.	3			Spec 4.12.2
4.1.4.2	OD 90 mm Plain ended 22.5-degree bend	No.	3			Spec 4.12.2
4.1.5	Junction Chambers					
4.1.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings. Concrete Strength tests (six cubes / test) in accordance with the Specifications.	No.	5			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Tank Sub-Main Pipeline 1 Offtake on OD 90mm section @ ch 0+160					
4.1.5.2	90/80 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.1.5.3	80 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.1.5.4	80 x 25 mm all flanged steel tee	No	1			Spec 4.3
4.1.5.5	80 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.1.5.6	25 mm dia GI Nipple	No	1			
4.1.5.7	25 mm dia gate valve	No	1			Spec 4.13.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.1.5.8	25 mm dia GI union	No	1			
4.1.5.9	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.1.5.10	25 / 32 mm dia GI / HDPE adaptor	No.	1			
	1 No. Block Chamber for Tank Sub-Main Pipeline 2 Offtake on OD 90mm section @ ch 0+360					
4.1.5.11	90/80 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.1.5.12	80 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.1.5.13	80 x 40 mm all flanged steel tee	No	1			Spec 4.3
4.1.5.14	80 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.1.5.15	40 mm dia GI Nipple	No	1			
4.1.5.16	40 mm dia gate valve	No	1			Spec 4.13.1
4.1.5.17	40 mm dia GI union	No	1			
4.1.5.18	40 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.1.5.19	40 / 50 mm dia VJ stepped coupling	No.	1			Spec 4.4
	1 No. Block Chamber for Tank Sub-Main Pipeline 3 Offtake on OD 63mm section @ ch 0+380					
4.1.5.20	63/50 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.1.5.21	50 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.1.5.22	50 x 25 mm all flanged steel tee	No	1			Spec 4.3
4.1.5.23	50 mm dia double flanged gate valve	No.	1			Spec 4.13.1
4.1.5.24	25 mm dia GI Nipple	No	1			

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.1.5.25	25 mm dia gate valve	No	1			Spec 4.13.1
4.1.5.26	25 mm dia GI union	No	1			
4.1.5.27	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.1.5.28	25 / 32 mm dia GI / HDPE adaptor	No.	1			
	1 No. Block Chamber for Tank Sub-Main Pipeline 4 Offtake on OD 40mm section @ ch 0+700					
4.1.5.29	40/32 mm dia HDPE / GI adaptor	No	2			
4.1.5.30	32 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.1.5.31	32 x 25 mm all flanged steel tee	No	1			Spec 4.3
4.1.5.32	32 mm dia GI Nipple	No	1			
4.1.5.33	32 mm dia GI union	No	1			
4.1.5.34	32 mm dia gate valve	No.	1			Spec 4.13.1
4.1.5.35	25 mm dia GI Nipple	No	1			
4.1.5.36	25 mm dia gate valve	No	1			Spec 4.13.1
4.1.5.37	25 mm dia GI union	No	1			
4.1.5.38	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.1.5.39	25 / 32 mm dia GI / HDPE adaptor	No.	1			Spec 4.4
	1 No. Block Chamber for Tank Sub-Main Pipeline 5 Offtake on OD 40mm section @ ch 1+078					
4.1.5.29	40/32 mm dia HDPE / GI adaptor	No	2			Spec 4.4
4.1.5.30	32 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.1.5.32	32 mm dia GI Nipple	No	1			

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.1.5.33	32 mm dia GI union	No	1			
4.1.5.34	32 mm dia gate valve	No.	1			Spec 4.13.1
4.1.6	PLOT OFFTAKE FITTINGS					
4.1.6.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	3			Spec 4.4
4.1.7	AIR VALVES					
4.1.7.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
4.1.7.2	1 No. Single Acting Air Valve (SAV)					Spec 4.15
4.1.7.3	90 / 80 mm dia VJ stepped coupling	No.	2			Spec 4.4
4.1.7.4	80 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
4.1.7.5	80 x 50 mm double flanged steel tee	No.	1			Spec 4.3
4.1.7.6	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
4.1.7.7	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.1.7.8	50 mm dia Single orifice air valve	No.	1			Spec 4.15
4.1.8	WASHOUTS					
4.1.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Steel fittings to be epoxy coated inside and outside. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					Spec 4.8.2
	1No. Washout Fittings at chainages shown in the drawings					Spec 5.17
4.1.8.2	40/32 mm dia PVC-U / GI stepped coupling	No.	2			Spec 4.4
4.1.8.3	32 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
4.1.8.4	32 mm x 25 mm dia level invert scour steel tee all flanged	No.	1			Spec 4.3
4.1.8.5	25 mm dia GI Nipple	No	1			
4.1.8.6	25 mm dia gate valve	No	1			Spec 4.13.1
4.1.8.7	25 mm dia GI union	No	1			
4.1.8.8	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.1.8.9	25 / 32 mm dia GI / HDPE adaptor	No.	1			
4.1.8.10	32 mm HDPE PN6 pipe	m	6			
4.1.8.11	25 mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.1.9	PRESSURE REGULATING VALVES					
4.1.9.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	1 No. Pressure Regulator Valve (PRV) at Ch 0+680 m					Spec 4.18
4.1.9.2	63/50 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.1.9.3	50 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
4.1.9.4	50 mm dia GI Nipple	No	1			
4.1.9.5	50 mm dia GI union	No	1			
4.1.9.6	DN 50 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
4.1.9.7	Provide and install DN 50mm PRV-18	No.	1			Spec 4.18
	1 No. Pressure Regulator Valve (PRV) at Ch 0+280 m					
4.1.9.8	90/80 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.1.9.9	80 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
4.1.9.10	DN 80 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
4.1.9.11	Provide and install DN 80 mm PRV-25	No.	1			Spec 4.18
4.1.10	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainages shown in drawings					
4.1.10.1	Volume of Mass Concrete Class 20/20	m ³	3.31			Spec 3.2.3.1
4.1.11	THRUST BLOCKS					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.1.7.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	6			Spec 3.2.3.1
4.1.12	OCCUPATIONAL HEALTH & SAFETY					
4.1.12.1.	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Mainline Pipeline 1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 4-2 - Pump Mainline 2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specification s Ref.
4.2.1	Site Clearance and Setting Out					
4.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1143			Spec 2.2
4.2.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
4.2.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	914			Spec 2.9
4.2.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	274			Spec 2.9
4.2.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	183			Spec 2.9
4.2.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.2.3.1	OD 160mm HDPE pipes, PN 6	m	1,143			Spec 4.12.1
4.2.4	BENDS					
	Supply and Install the following HDPE PN16 fittings					Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.2.4.1	OD 160mm Plain ended 90-degree bend	No.	6			Spec 4.12.2
4.2.5	Junction Chambers					
4.2.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	4			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Tank Sub-main Pipelines 2-1 Offtake on OD160mm section @ ch 0+780					
4.2.5.2	160/ 160 mm dia VJ stepped coupling	No	2			Spec 4.4
4.2.5.3	160mm dia single flanged steel spigot (0.5 m long)	No	2			Spec 4.6.1
4.2.5.4	160x 90 mm all flanged steel tee	No	1			Spec 4.3
4.2.5.5	160 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.2.5.6	90 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.2.5.7	90mm dia 0.5m long single flanged GI piece	No	1			
4.2.5.8	90/ 90mm dia VJ stepped coupling	No.	1			Spec 4.4
	1 No. Chamber for Tank Sub-main Pipeline 2-2 Offtake on OD225mm section @ ch 0+880					
4.2.5.9	160/ 160mm dia VJ stepped coupling	No	2			Spec 4.4
4.2.5.10	160mm dia single flanged steel spigot (0.5 m long)	No	2			Spec 4.6.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.2.5.11	160 25 mm all flanged steel tee	No	1			Spec 4.3
4.2.5.12	160mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.2.5.13	25 mm dia GI Nipple	No	1			
4.2.5.14	25 mm dia gate valve	No	1			Spec 4.13.1
4.2.5.15	25 mm dia GI union	No	1			
4.2.5.16	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.2.5.17	25 / 32 mm dia GI / HDPE adaptor	No.	1			
	1 No. Chamber for Tank Sub-main Pipelines 2-3 and 2-4 Offtakes on OD225mm section @ ch 1+143					
4.2.5.18	160/160mm dia VJ stepped coupling	No	1			Spec 4.4
4.2.5.19	160 mm dia single flanged steel spigot (0.5 m long)	No	1			Spec 4.6.1
4.2.5.20	160 x 125 mm all flanged steel tee	No	1			Spec 4.3
4.2.5.21	125 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.2.5.22	125 mm dia 0.5m long single flanged GI piece	No	1			Spec 4.3
4.2.5.23	125 / 140 mm dia VJ stepped coupling	No.	1			Spec 4.4
4.2.5.24	160x 40 mm all flanged reducer	No.	1			Spec 4.3
4.2.5.25	40 mm dia GI Nipple	No	1			
4.2.5.26	40 mm dia gate valve	No	1			Spec 4.13.1
4.2.5.27	40 mm dia GI union	No	1			
4.2.5.28	40 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.2.5.29	40 / 50 mm dia VJ stepped coupling	No.	1			Spec 4.4

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.2.6	PLOT OFFTAKE FITTINGS					
4.2.6.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	3			Spec 4.12.2
4.2.6.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	2			Spec 4.18
4.2.7	AIR VALVES					
4.2.7.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
4.2.7.2	1 No. Double Air Valve (DAV)					Spec 4.15
4.2.7.3	160/ 160 mm dia VJ stepped coupling	No.	2			Spec 4.4
4.2.7.4	160 mm dia single flanged steel spigot (0.5 m long)	No.	2			Spec 4.6.1
4.2.7.5	160x 50 mm all flanged steel tee	No.	1			Spec 4.3
4.2.7.6	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
4.2.7.7	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.2.7.8	50 mm dia double orifice air valve	No.	1			Spec 4.15
4.2.8	WASHOUTS					
4.2.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
4.2.8.2	160/ 200 mm dia VJ stepped coupling	No.	2			Spec 4.4
4.2.8.3	160mm dia single flanged steel spigot (0.5 m long)	No.	2			Spec 4.6.1
4.2.8.4	160 x 50 mm all flanged steel tee	No.	1			Spec 4.3
4.2.8.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.2.8.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
4.2.8.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			Spec 4.4
4.2.8.8	63 mm HDPE PN 6.0 pipe	m	6			Spec 4.12.2.
4.2.8.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.2.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainages shown in drawings					
4.2.9.1	Volume of Mass Concrete Class 20/20	m ³	1.66			Spec 3.2.3.1
4.2.10	RIVER CROSSINGS FOR PIPES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	1 No. River crossings at Chainages in line with drawings.					
4.2.10.1	Excavation for foundation	m ³	2.88			Spec 2.11
4.2.10.2	Provide, place blinding concrete C15	m ³	0.06			Spec 3.2.3.2
4.2.10.3	C25 Concrete to bases and columns	m ³	0.80			Spec 3.2.3.3
4.2.10.4	Provide and fix steel reinforcement	kg	76			Spec 3.2.3.4
4.2.10.5	Provide install flanged DN200mm epoxy coated steel pipe including fittings and jointing in line with drawings	m	10			Spec 4.8.2
4.2.11	THRUST BLOCKS					
4.2.11.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	6			Spec 3.2.3.1
4.2.12	OCCUPATIONAL HEALTH & SAFETY					
4.2.12.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Mainline Pipeline 2	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 4-3 - Mainline 1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
4.3.1	Site Clearance and Setting Out					
4.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1480			Spec 2.2
4.3.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
4.3.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,184			Spec 2.9
4.3.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	355			Spec 2.9
4.3.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	237			Spec 2.9
4.3.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.3.3.1	OD 160 mm HDPE pipes, PN 6.	m	700			Spec 4.12.1
4.3.3.2	OD 90mm HDPE pipes, PN 6.	m	780			Spec 4.12.1
4.3.4	BENDS					
	Supply and Install the following HDPE PN16 fittings					Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.3.4.1	OD 160 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
4.3.4.2	OD 160 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
4.3.4.3	OD 90 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
4.3.4.4	OD 90 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
4.3.5	Junction Chambers					
4.3.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	3			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Main Pipeline 2 Offtake at 200mm section @ ch 0+460					
4.3.5.2	160/ 160 mm dia VJ stepped coupling	No	2			Spec 4.4
4.3.5.3	160 mm dia single flanged steel spigot (0.5 m long)	No	2			Spec 4.6.1
4.3.5.4	160 /125 mm all flanged steel tee	No	1			Spec 4.3
4.3.5.5	160mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.3.5.6	125 mm dia double flanged sluice valve	No.	1			Spec 4.13.2
4.3.5.7	125 mm dia 0.5m long single flanged GI piece	No	1			Spec 4.3
4.3.5.8	125 / 140 mm dia VJ stepped coupling	No.	1			Spec 4.4
	1 No. Chamber for Sub-main Pipelines 1-1 and 1-2 Offtakes on OD110mm section @ ch 1+480					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.3.5.9	110 / 100 mm dia VJ stepped coupling	No	1			Spec 4.4
4.3.5.10	100 mm dia single flanged steel spigot (0.5 m long)	No	1			Spec 4.6.1
4.3.5.11	100 x 65 mm all flanged steel tee	No	1			Spec 4.3
4.3.5.12	65 mm dia GI Nipple	No	1			
4.3.5.13	65 mm dia gate valve	No	1			Spec 4.13.1
4.3.5.14	65 mm dia GI union	No	1			
4.3.5.15	65 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.3.5.16	65/75 mm dia VJ stepped coupling	No.	1			Spec 4.4
4.3.5.17	100 x 40 mm all flanged reducer	No.	1			Spec 4.3
4.3.5.18	40 mm dia GI Nipple	No	1			
4.3.5.19	40 mm dia gate valve	No	1			Spec 4.13.1
4.3.5.20	40 mm dia GI union	No	1			
4.3.5.21	40 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
4.3.5.22	40 / 50 mm dia VJ stepped coupling	No.	1			Spec 4.4
4.3.6	PLOT OFFTAKE FITTINGS					
4.3.6.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	11			Spec 4.12.2
4.3.6.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	4			Spec 4.18
4.3.7	AIR VALVES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.3.7.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Double Air Valve (DAV)					Spec 4.15
4.3.7.2	110 / 100 mm dia VJ stepped coupling	No.	2			Spec 4.4
4.3.7.3	100 mm dia single flanged steel spigot (0.5 m long)	No.	2			Spec 4.6.1
4.3.7.4	100 x 50 mm all flanged steel tee	No.	1			Spec 4.3
4.3.7.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
4.3.7.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.3.7.7	50 mm dia double orifice air valve	No.	1			Spec 4.15
4.3.8	WASHOUTS					
4.3.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
4.3.8.2	110 / 100 mm dia VJ stepped coupling	No.	2			Spec 4.4
4.3.8.3	100 mm dia single flanged steel spigot (0.5 m long)	No.	2			Spec 4.6.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.3.8.4	100 x 50 mm all flanged steel tee	No.	1			Spec 4.3
4.3.8.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.3.8.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
4.3.8.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			
4.3.8.8	63 mm HDPE PN 6.0 pipe	m	6			Spec 4.12.2
4.3.8.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.3.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainages shown in drawings					
4.3.9.1	Volume of Mass Concrete Class 20/20	m ³	3.32			Spec 3.2.3.1
4.3.10	THRUST BLOCKS					
4.3.10.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	8			Spec 3.2.3.1
4.3.11	OCCUPATIONAL HEALTH & SAFETY					
4.3.11.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Mainline Pipeline 1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 4-4 - Mainline 2

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
4.4.1	Site Clearance and Setting Out					
4.4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	1718			Spec 2.2
4.4.2	Excavation and Backfilling					
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
4.4.2.1	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,374			Spec 2.9
4.4.2.2	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	412			Spec 2.9
4.4.2.3	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	275			Spec 2.9
4.4.3	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
4.4.3.1	OD 140 mm HDPE pipes, PN 6	m	1,718			Spec 4.12.1
4.4.4	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.4.4.1	OD 140 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
4.4.4.2	OD 140 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
4.4.5	Junction Chambers					
4.4.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Sub-Main Pipelines 2-1 and 2-2 Offtakes on 140mm section @ ch 1+718					
4.4.5.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.4.5.3	125 mm dia single flanged GI pipe (0.5 m long)	No	3			Spec 4.3
4.4.5.4	125 x 125 mm all flanged steel tee	No	1			Spec 4.3
4.4.5.5	125 mm dia double flanged sluice valve	No.	2			Spec 4.13.2
4.4.5.6	140/125 mm dia HDPE-U / GI stepped coupling	No	1			Spec 4.4
4.4.6	PLOT OFFTAKE FITTINGS					
4.4.6.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	24			Spec 4.12.2
4.4.6.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	2			Spec 4.18

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.4.7	AIR VALVES					
4.4.7.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Double Air Valve (DAV)					Spec 4.15
4.4.7.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.4.7.3	125 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.4.7.4	125 x 50 mm all flanged steel tee	No	1			Spec 4.3
4.4.7.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
4.4.7.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.4.7.7	50 mm dia double orifice air valve	No.	1			Spec 4.15
4.4.8	WASHOUTS					
4.4.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					Spec 5.17

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.4.8.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.4.8.3	125 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
4.4.8.4	125 x 50 mm all flanged steel tee	No	1			Spec 4.3
4.4.8.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
4.4.8.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
4.4.8.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			
4.4.8.8	63 mm HDPE PN 6.0 pipe	m	6			Spec 4.12.2
4.4.8.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
4.4.9	PRESSURE REGULATING VALVES					
4.4.9.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 0+740 m					Spec 4.18
4.4.9.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
4.4.9.3	125 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
4.4.9.4	DN 125 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
4.4.9.5	Provide and install DN 125 mm PRV-25	No.	1			Spec 4.18

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

4.4.10	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	3 No. Minor Road Crossing at Chainages shown in drawings					
4.4.10.1	Volume of Mass Concrete Class 20/20	m ³	4.98			Spec 3.2.3.1
4.4.11	THRUST BLOCKS					
4.4.11.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	4			Spec 3.2.3.1
4.4.12	OCCUPATIONAL HEALTH & SAFETY					
4.4.12.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Mainline Pipeline 2	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

BILL NO. 5 - SUBMAIN PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 5.1 Pump Sub-Main Pipeline 1-1	
2	Bill No. 5.2 Pump Sub-Main Pipeline 1-2	
3	Bill No. 5.3 Pump Sub-Main Pipeline 1-3	
4	Bill No. 5.4 Pump Sub-Main Pipeline 1-4	
5	Bill No. 5.5 Pump Sub-Main Pipeline 1-5	
6	Bill No. 5.6 Pump Sub-Main Pipeline 2-1	
7	Bill No. 5.7 Pump Sub-Main Pipeline 2-2	
8	Bill No. 5.8 Pump Sub-Main Pipeline 2-3	
9	Bill No. 5.9 Pump Sub-Main Pipeline 2-4	
10	Bill No. 5.10 Sub-Main Pipeline 1-1	
11	Bill No. 5.11 Sub-Main Pipeline 1-2	
12	Bill No. 5.12 Sub-Main Pipeline 2-1	
13	Bill No. 5.13 Sub-Main Pipeline 2-2	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.1 - Pump Sub-Main Pipeline 1-1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.1.1	Site clearance, Excavation and Backfilling					
5.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	105			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.1.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	63			Spec 2.9
5.1.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	3			Spec 2.9
5.1.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	3			Spec 2.9
5.1.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.1.2.1	OD 32 mm HDPE pipes, PN 6.0	m	105			Spec 4.12.1
5.1.3	PLOT OFFTAKE FITTINGS					
5.1.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	2			Spec 4.4
5.1.4	PRESSURE REGULATING VALVES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.1.4.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 0+020 m					Spec 4.18
5.1.4.2	32 / 25 mm dia GI / HDPE adaptor	No	2			Spec 4.4
5.1.4.3	25 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.1.4.4	25 mm dia GI Nipple	No	1			
5.1.4.5	25 mm dia gate valve for PRV isolation	No	1			Spec 4.13.1
5.1.4.6	25 mm dia GI union	No	1			
5.1.4.7	Provide and install DN 25mm PRV-10	No.	1			Spec 4.18
5.1.5	OCCUPATIONAL HEALTH & SAFETY					
5.1.5.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 1-1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.2 - Pump Sub-Main Pipeline 1-2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.2.1	Site clearance, Excavation and Backfilling					
5.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	383.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.2.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	230			Spec 2.9
5.2.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	11			Spec 2.9
5.2.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	11			Spec 2.9
5.2.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.2.2.1	OD 50 mm HDPE pipes, PN 6.0	m	240			Spec 4.12.1
5.2.2.2	OD 40 mm HDPE pipes, PN 6.0	m	143			Spec 4.12.1
5.2.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
5.2.3.1	OD 50 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.2.3.2	OD 50 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.2.3	PLOT OFFTAKE FITTINGS					
5.2.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	6			Spec 4.4
5.2.4	AIR VALVES					
5.2.4.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV)					Spec 4.15
5.2.4.2	40 / 32 mm dia HDPE adaptor	No.	2			
5.2.4.3	32 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.2.4.4	32 mm x 25 mm dia GI tee threaded	No.	1			Spec 5.8
5.2.4.5	25 mm dia x 500mm long threaded Steel pipe	No.	1			Spec 5.8
5.2.4.6	25 mm flanged gate valve	No.	1			Spec 4.13.1
5.2.4.7	25 mm single orifice air valve	No.	1			Spec 4.15
5.2.5	WASHOUTS					
5.2.5.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
5.2.5.2	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 4.4
5.2.5.3	40 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
5.2.5.4	40 mm x 32mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
5.2.5.5	32 mm flanged gate valve	No.	1			Spec 4.13.1
5.2.5.6	32 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.2.5.7	40 / 32 mm dia HDPE / GI adaptor	No.	2			Spec 4.4
5.2.5.8	40 mm HDPE PN 6.0 pipe	m	6			Spec 4.12.2
5.2.5.9	32mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.2.6	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage as indicated on drawing					
5.2.6.1	Volume of Mass Concrete Class 20/20	m ³	1.16			Spec 3.2.3.1
5.2.7	THRUST BLOCKS					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.2.7.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	4			Spec 3.2.3.1
5.2.8	OCCUPATIONAL HEALTH & SAFETY					
5.2.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 1-2	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.3 - Pump Sub-Main Pipeline 1-3						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.3.1	Site clearance, Excavation and Backfilling					
5.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	280.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.3.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	168			Spec 2.9
5.3.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	50			Spec 2.9
5.3.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	34			Spec 2.9
5.3.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.3.2.1	OD 32 mm HDPE pipes, PN 6.0	m	180			Spec 4.12.1
5.3.2.2	OD 25 mm HDPE pipes, PN 6.0	m	100			Spec 4.12.1
5.3.3	PLOT OFFTAKE FITTINGS					
5.3.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	7			Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.3.4	OCCUPATIONAL HEALTH & SAFETY					
5.3.4.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 1-3	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.4 - Pump Sub-Main Pipeline 1-4						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.4.1	Site clearance, Excavation and Backfilling					
5.4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	384.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.4.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	230			Spec 2.9
5.4.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	35			Spec 2.9
5.4.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	46			Spec 2.9
5.4.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.4.2.1	OD 32 mm HDPE pipes, PN 6.0	m	384			Spec 4.12.1
5.4.3	PLOT OFFTAKE FITTINGS					
5.4.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	4			Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.4.3.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	1			Spec 4.18
5.4.4	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage indicated on drawings					
5.4.4.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1
5.4.5	OCCUPATIONAL HEALTH & SAFETY					
5.4.5.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 1-4	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.5 - Pump Sub-Main Pipeline 1-5						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.5.1	Site clearance, Excavation and Backfilling					
5.5.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	280.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.5.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	168			Spec 2.9
5.5.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	25			Spec 2.9
5.5.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	34			Spec 2.9
5.5.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.5.2.1	OD 40 mm HDPE pipes, PN 6.0	m	280			Spec 4.12.1
5.5.3	PLOT OFFTAKE FITTINGS					
5.5.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	4			Spec 4.12.2
5.5.4	OCCUPATIONAL HEALTH & SAFETY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.5.4.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 1-5	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.6 - Pump Sub-Main Pipeline 2-1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.6.1	Site clearance, Excavation and Backfilling					
5.6.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	380.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.6.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	228			Spec 2.9
5.6.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	34			Spec 2.9
5.6.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	46			Spec 2.9
5.4.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.4.2.1	OD 140 mm HDPE pipes, PN 8.0	m	380			Spec 4.12.1
5.4.3	Junction Chambers					
5.4.3.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 4.21

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Block Chamber for Secondary Pipelines 2-1-1 and 2-1-2 Offtakes on 140mm section @ ch 0+380					
5.4.3.2	140/125 mm dia HDPE-U / GI stepped coupling	No	1			Spec 4.4
5.4.3.3	125 mm dia single flanged GI pipe (0.5 m long)	No	1			Spec 4.3
5.4.3.4	125 x 100 mm all flanged steel tee	No	1			Spec 4.3
5.4.3.5	100 mm dia double flanged sluice valve	No.	2			Spec 4.13.2
5.4.3.6	100 mm dia single flanged GI pipe (0.5 m long)	No.	2			Spec 4.3
5.4.3.7	125 x 100 mm all flanged reducer	No.	1			Spec 4.3
5.4.3.8	100 / 110 mm dia V/J stepped couplings	No	2			Spec 4.4
5.4.4	PLOT OFFTAKE FITTINGS					
5.4.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	5			Spec 4.12.2
5.4.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	5			Spec 4.18
5.4.5	AIR VALVES					
5.4.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	2 No. Double Air Valve (DAV)					Spec 4.15
5.4.5.2	140/125 mm dia HDPE-U / GI stepped coupling	No	4			Spec 4.4
5.4.5.3	125 mm dia single flanged GI pipe (0.5 m long)	No	4			Spec 4.3
5.4.5.4	125 x 50 mm all flanged steel tee	No	2			Spec 4.3
5.4.5.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
5.4.5.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.4.5.7	50 mm dia double orifice air valve	No.	2			Spec 4.15
5.4.6	WASHOUTS					
5.4.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
5.4.6.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
5.4.6.3	125 mm dia single flanged GI pipe (0.5 m long)	No	2			Spec 4.3
5.4.6.4	125 x 50 mm all flanged steel tee	No	1			Spec 4.3
5.4.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.4.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.4.6.7	50 / 63 mm dia HDPE / GI adaptor	No.	1			Spec 4.4
5.4.6.8	63 mm HDPE PN6 pipe	m	6			Spec 4.12.1
5.4.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
5.4.7	RIVER CROSSINGS FOR PIPES					
	Provide for rivercrossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	1 No. River crossings at Chainages in line with drawings.					
5.4.7.1	Excavation for foundation	m ³	2.88			Spec 2.11
5.4.7.2	Provide, place blinding concrete C15	m ³	0.06			Spec 3.2.3.2
5.4.7.3	C25 Concrete to bases and columns	m ³	0.80			Spec 3.2.3.3
5.4.7.4	Provie and fix steel reinforcement	kg	76			Spec 3.2.3.4
5.4.7.5	Provide install flanged DN125mm epoxy coated steel pipe including fittings and jointing in line with drawings	m	10			Spec 4.8.2
5.4.8	OCCUPATIONAL HEALTH & SAFETY					
5.4.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump_Sub-Main Pipeline 2-1	Lumpsu m	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.7 - Pump Sub-Main Pipeline 2-2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.7.1	Site clearance, Excavation and Backfilling					
5.7.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	162.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.7.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	97			Spec 2.9
5.7.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	15			Spec 2.9
5.7.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	19			Spec 2.9
5.7.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.7.2.1	OD 32 mm HDPE pipes, PN 6.0	m	162			Spec 4.12.1
5.7.3	PLOT OFFTAKE FITTINGS					
5.7.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	2			Spec 4.12.2
5.7.4	PRESSURE REGULATING VALVES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.7.4.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 0+020 m					Spec 4.18
5.7.4.2	32 / 25 mm dia GI / HDPE adaptor	No	2			
5.7.4.3	25 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.7.4.4	25 mm dia GI Nipple	No	1			
5.7.4.5	25 mm dia gate valve for PRV isolation	No	1			Spec 4.13.1
5.7.4.6	25 mm dia GI union	No	1			
5.7.4.7	Provide and install DN 25mm PRV-30	No.	1			Spec 4.18
5.7. 5	OCCUPATIONAL HEALTH & SAFETY					
5.7,5.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 2-2	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.8 - Pump Sub-Main Pipeline 2-3						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.8.1	Site clearance, Excavation and Backfilling					
5.8.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	198.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.8.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	119			Spec 2.9
5.8.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	6			Spec 2.9
5.8.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	6			Spec 2.9
5.8.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.8.2.1	OD 50 mm HDPE pipes, PN 6.0	m	100			Spec 4.12.1
5.8.2.2	OD 40 mm HDPE pipes, PN 6.0	m	98			Spec 4.12.1
5.8.3	PLOT OFFTAKE FITTINGS					
5.8.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	2			Spec 4.12.2
5.8.4	Junction Chambers					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.8.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Tank Sec Pipeline 2-3-1 Offtake on OD50mm section @ ch 0+040					
5.8.4.2	50 / 40 mm dia VJ stepped coupling	No	3			Spec 4.4
5.8.4.3	40 mm dia single flanged steel spigot (0.5 m long)	No	5			Spec 4.6.1
5.8.4.4	40 x 40 mm all flanged steel tee	No	1			Spec 4.3
5.8.4.5	40 mm dia GI Nipple	No	2			
5.8.4.6	40 mm dia gate valve	No	2			Spec 4.13.1
5.8.4.7	40 mm dia GI union	No	2			
5.8.5	AIR VALVES					
5.8.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV)					Spec 4.15
5.8.5.2	40 / 32 mm dia HDPE adaptor	No.	2			

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.8.5.3	32 mm dia 0.5m long single flanged GI piece	No.	2			
5.8.5.4	32 mm x 25 mm dia GI tee threaded	No.	1			
5.8.5.5	25 mm dia x 500mm long threaded Steel pipe	No.	1			
5.8.5.6	25 mm flanged gate valve	No.	1			Spec 4.13.1
5.8.5.7	25 mm single orifice air valve	No.	1			Spec 4.15
5.8.6	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage as indicated on drawing					
5.8.6.1	Volume of Mass Concrete Class 20/20	m ³	1.16			Spec 3.2.3.1
5.8.7	OCCUPATIONAL HEALTH & SAFETY					
5.8.7.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 2-3	Lumpsu m	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.9 - Pump Sub-Main Pipeline 2-4						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.9.1	Site clearance, Excavation and Backfilling					
5.9.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	4242			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.9.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	2,545			Spec 2.9
5.9.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	764			Spec 2.9
5.9.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	509			Spec 2.9
5.9.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.9.2.1	OD 140 mm HDPE pipes, PN 6.0	m	600			Spec 4.12.1
5.9.2.2	OD 110 mm HDPE pipes, PN 6.0	m	3,280			Spec 4.12.1
5.9.2.2	OD 50 mm HDPE pipes, PN 6.0	m	362			Spec 4.12.1
5.9.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.9.3.1	OD 140 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.9.3.2	OD 140 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.9.3.3	OD 140 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.9.3.4	OD 110 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.9.3.5	OD 110 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.9.3.6	OD 110 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.9.3.7	OD 50 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.9.3.8	OD 50 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.9.3.9	OD 50 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.9.4	PLOT OFFTAKE FITTINGS					
5.9.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	61			Spec 4.12.2
5.9.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	7			Spec 4.18
5.9.5	AIR VALVES					
5.9.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	3			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	2 No. Single Air Valve (SAV)					Spec 4.15
5.9.5.2	110 / 100 mm dia V/J stepped coupling	No.	4			Spec 4.4

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.9.5.3	100mm, 0.5m long single flanged GI piece	No.	4			Spec 4.3
5.9.5.4	100 x 50 mm double flanged steel tee	No.	2			Spec 4.3
5.9.5.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
5.9.5.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.9.5.7	50 mm dia Single orifice air valve	No.	2			Spec 4.15
	1 No. Single Air Valve (SAV)					Spec 4.15
5.9.5.8	140 / 125 mm dia V/J stepped coupling	No.	2			Spec 4.4
5.9.5.9	125mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.9.5.10	125 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.9.5.11	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
5.9.5.12	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.9.5.13	50 mm dia Single orifice air valve	No.	1			Spec 4.15
5.9.6	WASHOUTS					
5.9.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	2 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
5.9.6.2	110 / 100 mm dia VJ stepped coupling	No.	4			Spec 4.4
5.9.6.3	100 mm dia 0.5m long single flanged	No.	4			Spec 4.3

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.9.6.4	100 x 50 mm dia Level invert scour tee all flanged	No.	2			Spec 4.3
5.9.6.5	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.9.6.6	50 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.9.6.7	50 / 63 mm dia HDPE / GI adaptor	No.	4			
5.9.6.8	63 mm HDPE PN6 pipe	m	12			
5.9.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	2			Spec 4.16.1
5.9.7	PRESSURE REGULATING VALVES					
5.9.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	4			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	4 No. Pressure Regulator Valve (PRV) at Ch 0+640 m, 1+580m, 1+980m, and 3+860m					Spec 4.18
5.9.7.2	110/100 mm dia HDPE-U / GI stepped coupling	No	8			Spec 4.4
5.9.7.3	100 mm dia single flanged GI pipe (500mm)	No.	8			Spec 4.3
5.9.7.4	DN 100 flanged gate valves for PRV isolation	No.	4			Spec 4.13.1
5.9.7.5	Provide and install DN 100 mm PRV-25, PRV-40, PRV-20, and PRV-35	No.	4			Spec 4.18
5.9.8	ROAD CROSSINGS FOR PIPES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainage indicated on drawings					
5.9.8.1	Volume of Mass Concrete Class 20/20	m ³	2.10			Spec 3.2.3.1
5.9.9	THRUST BLOCKS					
5.9.9.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	18			Spec 3.2.3.1
5.9.10	OCCUPATIONAL HEALTH & SAFETY					
5.9.10.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump Sub-Main Pipeline 2-4	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.10 - Sub-Main Pipeline 1-1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.10.1	Site clearance, Excavation and Backfilling					
5.10.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	480.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.10.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	288			Spec 2.9
5.10.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	14			Spec 2.9
5.10.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	14			Spec 2.9
5.10.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.10.2.1	OD 50 mm HDPE pipes, PN 6.0	m	240			Spec 4.12.1
5.10.2.2	OD 40 mm HDPE pipes, PN 6.0	m	240			Spec 4.12.1
5.10.3	PLOT OFFTAKE FITTINGS					
5.10.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	4			Spec 4.12.2
5.10.4	Junction Chambers					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.10.4.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sec Pipelines 1-1-1 and 1-1-2 Offtakes on OD40mm section @ ch 0+480					
5.10.4.2	40 / 32 mm dia GI / HDPE adaptor	No	1			
5.10.4.3	32 mm dia threaded spigot (0.5 m long)	No	1			Spec 4.6.1
5.10.4.4	32 x 25 mm threaded GI tee	No	1			
5.10.4.5	32 x 25 threaded reducer	No	1			
5.10.4.6	25 mm dia GI Nipple	No	2			
5.10.4.7	25 mm dia gate valve	No	2			Spec 4.13.1
5.10.4.8	25 mm dia GI union	No	2			
5.10.4.9	25 mm dia 0.5m long single flanged GI piece	No	4			Spec 4.3
5.10.4.10	25 / 32 mm dia GI / HDPE adaptor	No.	2			
5.10.5	AIR VALVES					
5.10.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV)					Spec 4.15
5.10.5.2	50 / 40 mm dia V/J stepped coupling	No.	2			Spec 4.4
5.10.5.3	40mm , 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.10.5.4	40 x 32 mm double flanged steel tee	No.	1			Spec 4.3
5.10.5.5	32 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
5.10.5.6	32 mm flanged gate valve	No.	1			Spec 4.13.1
5.10.5.7	32 mm dia Single orifice air valve	No.	1			
5.10.6	PRESSURE REGULATING VALVES					
5.10.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 0+020 m					Spec 4.18
5.10.6.2	50 / 40 mm dia VJ stepped coupling	No	2			Spec 4.4
5.10.6.3	40 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.10.6.4	40 mm dia GI Nipple	No	1			
5.10.6.5	40 mm dia gate valve for PRV isolation	No	1			Spec 4.13.1
5.10.6.6	40 mm dia GI union	No	1			
5.10.6.7	Provide and install DN 40mm PRV-22	No.	1			Spec 4.18

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.10.7	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage as indicated on drawing					
5.10.7.1	Volume of Mass Concrete Class 20/20	m ³	1.16			Spec 3.2.3.1
5.10.8	OCCUPATIONAL HEALTH & SAFETY					
5.10.8.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Sub-Main Pipeline 1-1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.11 - Sub-Main Pipeline 1-2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.11.1	Site clearance, Excavation and Backfilling					
5.11.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	380.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.11.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	228			Spec 2.9
5.11.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	11			Spec 2.9
5.11.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	11			Spec 2.9
5.11.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.11.2.1	OD 75 mm HDPE pipes, PN 6.0	m	560			Spec 4.12.1
5.11.2.2	OD 63 mm HDPE pipes, PN 6.0	m	840			Spec 4.12.1
5.11.2.3	OD 50 mm HDPE pipes, PN 6.0	m	160			Spec 4.12.1
5.11.2.4	OD 40 mm HDPE pipes, PN 6.0	m	220			Spec 4.12.1
5.11.2.5	OD 25 mm HDPE pipes, PN 6.0	m	335			Spec 4.12.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.11.3	BENDS					
	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
5.11.3.1	OD 75 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.11.3.2	OD 75 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.11.3.3	OD 75 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.11.3.4	OD 63 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.11.3.5	OD 63 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.11.3.6	OD 63 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.11.4	PLOT OFFTAKE FITTINGS					
5.11.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	27			Spec 4.12.2
5.11.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	4			Spec 4.18
5.11.5	AIR VALVES					
5.11.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV)					Spec 4.15
5.11.5.2	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 4.4

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.11.5.3	50 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
5.11.5.4	50 x 50 mm double flanged steel tee	No.	1			Spec 4.3
5.11.5.5	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
5.11.5.6	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.11.5.7	50 mm dia Single orifice air valve	No.	1			Spec 4.15
5.11.6	WASHOUTS					
5.11.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Washout Fittings at chainage shown in the drawings					Spec 5.17
5.11.6.2	75 / 65 mm dia VJ stepped coupling	No.	2			Spec 4.4
5.11.6.3	65 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
5.11.6.4	65 mm x 50mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
5.11.6.5	50 mm flanged gate valve	No.	1			Spec 4.13.1
5.11.6.6	50 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
5.11.6.7	63 / 50 mm dia VJ stepped coupling	No.	2			Spec 4.4
5.11.6.8	63 mm HDPE PN6 pipe	m	6			
5.11.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.11.7	PRESSURE REGULATING VALVES					
5.11.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	3			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	2 No. Pressure Regulator Valve (PRV) at Ch 0+120 m and 0+540m					Spec 4.18
5.11.7.2	75 / 65 mm dia VJ stepped coupling	No	4			Spec 4.4
5.11.7.3	65 mm dia single flanged GI pipe (500mm)	No.	4			Spec 4.3
5.11.7.4	65 mm dia GI Nipple	No	2			
5.11.7.5	65 mm dia gate valve for PRV isolation	No	2			Spec 4.13.1
5.11.7.6	65 mm dia GI union	No	2			
5.11.7.7	Provide and install DN 65mm PRV-22 and PRV-26	No.	2			Spec 4.18
	1 No. Pressure Regulator Valve (PRV) at Ch 1+380 m					Spec 4.18
5.11.7.8	63 / 50 mm dia VJ stepped coupling	No	2			Spec 4.4
5.11.7.9	50 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.11.7.10	50 mm dia GI Nipple	No	1			
5.11.7.11	50 mm dia gate valve for PRV isolation	No	1			Spec 4.13.1
5.11.7.12	50 mm dia GI union	No	1			
5.11.7.13	Provide and install DN 50mm PRV-44	No.	1			Spec 4.18
5.11.8	RIVER CROSSINGS FOR PIPES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Provide for rivercrossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	1 No. River crossings at Chainages in line with drawings.					
5.11.8.1	Excavation for foundation	m ³	2.88			Spec 2.11
5.11.8.2	Provide, place blinding concrete C15	m ³	0.06			Spec 3.2.3.2
5.11.8.3	C25 Concrete to bases and columns	m ³	0.80			Spec 3.2.3.3
5.11.8.4	Provide and fix steel reinforcement	kg	76			Spec 3.2.3.4
5.11.8.5	Provide install flanged DN40mm epoxy coated steel pipe including fittings and jointing in line with drawings	m	10			Spec 4.8.2
5.11.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainage as indicated on drawing					
5.11.9.1	Volume of Mass Concrete Class 20/20	m ³	2.32			Spec 3.2.3.1
5.11.10	THRUST BLOCKS					
5.11.10.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	12			Spec 3.2.3.1
5.11.11	OCCUPATIONAL HEALTH & SAFETY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.11.11	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Sub-Main Pipeline 1-2	Lumpsu m	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.12 - Sub-Main Pipeline 2-1						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.12.1	Site clearance, Excavation and Backfilling					
5.12.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	3660			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.12.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	2,196			Spec 2.9
5.12.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	659			Spec 2.9
5.12.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	439			Spec 2.9
5.12.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.12.2.1	OD 140 mm HDPE pipes, PN 6.0	m	3,160			Spec 4.12.1
5.12.2.2	OD 90 mm HDPE pipes, PN 6.0	m	500			Spec 4.12.1
5.12.3	BENDS					
	Supply and install the following HDPE PN16 fittings					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.12.3.1	OD 140 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.12.3.2	OD 140 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.12.3.3	OD 140 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.12.4	PLOT OFFTAKE FITTINGS					
5.12.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	47			Spec 4.12.2
5.12.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	31			Spec 4.18
5.12.5	Junction Chambers					
5.12.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks, pipe supports, inspection covers, etc as detailed in the drawings.	No.	1			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sec Pipelines 2-1-1 and 2-1-2 Offtakes on OD90mm section @ ch 3+660					
5.12.5.2	90 / 80 mm dia V/J stepped coupling	No	1			Spec 4.4
5.12.5.3	80 mm dia single flanged spigot (0.5 m long)	No	1			Spec 4.6.1
5.12.5.4	80 x 50 mm double flanged steel tee	No	1			Spec 4.3

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.12.5.5	80 x 40mm all flanged reducer	No	1			Spec 4.3
5.12.5.6	50 mm dia GI Nipple	No	1			
5.12.5.7	50 mm dia gate valve	No	1			Spec 4.13.1
5.12.5.8	50 mm dia GI union	No	1			
5.12.5.9	50 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.12.5.10	63 / 50 mm dia VJ stepped coupling	No.	1			Spec 4.4
5.12.5.11	40 mm dia GI Nipple	No	1			
5.12.5.12	40 mm dia gate valve	No	1			Spec 4.13.1
5.12.5.13	40 mm dia GI union	No	1			
5.12.5.14	40 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.12.5.15	50 / 40 mm dia VJ stepped coupling	No	1			Spec 4.4
5.12.6	AIR VALVES					Spec 4.15
5.12.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	3			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	3 No. Single Air Valve (SAV)					Spec 4.15
5.12.6.2	140 / 125 mm dia V/J stepped coupling	No.	6			Spec 4.4
5.12.6.3	125mm, 0.5m long single flanged GI piece	No.	6			Spec 4.3

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.12.6.4	125 x 50 mm double flanged steel tee	No.	3			Spec 4.3
5.12.6.5	50 mm x 400mm long double flanged steel piece	No.	3			Spec 4.3
5.12.6.6	50 mm flanged gate valve	No.	3			Spec 4.13.1
5.12.6.7	50 mm dia Single orifice air valve	No.	3			Spec 4.15
5.12.7	WASHOUTS					
5.12.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	3			Spec 2.11
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	3 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
5.12.7.2	140 / 125 mm dia V/J stepped coupling	No.	6			Spec 4.4
5.12.7.3	125mm, 0.5m long single flanged GI piece	No.	6			Spec 4.3
5.12.7.4	125 x 50 mm double flanged steel tee	No.	3			Spec 4.3
5.12.7.5	50 mm flanged gate valve	No.	3			Spec 4.13.1
5.12.7.6	50 mm dia 0.5m long single flanged GI piece	No.	3			Spec 4.3
5.12.7.7	50 / 63 mm dia HDPE / GI adaptor	No.	6			
5.12.7.8	63 mm HDPE PN6 pipe	m	18			
5.12.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	3			Spec 4.16.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.12.8	PRESSURE REGULATING VALVES					
5.12.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 0+280m					Spec 4.18
5.12.8.2	140/125 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
5.12.8.3	125 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.12.8.4	DN 125 flanged gate valves for PRV isolation	No.	1			Spec 4.18
5.12.8.5	Provide and install DN 125 mm PRV-35	No.	1			Spec 4.18
	1 No. Pressure Regulator Valve (PRV) at Ch 3+420m					Spec 4.18
5.12.8.6	90/80 mm dia HDPE-U / GI stepped coupling	No	2			Spec 4.4
5.12.8.7	80 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.12.8.8	DN 80 flanged gate valves for PRV isolation	No.	1			Spec 4.13.1
5.12.8.9	Provide and install DN 80 mm PRV-40	No.	1			Spec 4.18
5.12.9	RIVER CROSSINGS FOR PIPES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	1 No. River crossings at Chainages in line with drawings.					
5.12.9.1	Excavation for foundation	m ³	2.88			Spec 2.11
5.12.9.2	Provide, place blinding concrete C15	m ³	0.06			Spec 3.2.3.2
5.12.9.3	C25 Concrete to bases and columns	m ³	0.80			Spec 3.2.3.3
5.12.9.4	Provide and fix steel reinforcement	kg	76			Spec 3.2.3.4
5.12.9.5	Provide install flanged DN125 mm epoxy coated steel pipe including fittings and jointing in line with drawings	m	10			Spec 4.8.2
5.12.10	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	2 No. Minor Road Crossing at Chainage indicated on drawings					
5.12.10.1	Volume of Mass Concrete Class 20/20	m ³	2.10			Spec 3.2.3.1
5.12.11	THRUST BLOCKS					
5.12.11.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	6			Spec 3.2.3.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.12.12	OCCUPATIONAL HEALTH & SAFETY					
5.12.12.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Sub-Main Pipeline 2-1	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 5.13 - Sub-Main Pipeline 2-2						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
5.13.1	Site clearance, Excavation and Backfilling					
5.13.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	3043			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
5.13.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,826			Spec 2.9
5.13.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	548			Spec 2.9
5.13.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	365			Spec 2.9
5.13.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
5.13.2.1	OD 125 mm HDPE pipes, PN 6.0	m	1,640			Spec 4.12.1
5.13.2.2	OD 63 mm HDPE pipes, PN 6.0	m	960			Spec 4.12.1
5.13.2.2	OD 25 mm HDPE pipes, PN 6.0	m	443			Spec 4.12.1
5.13.3	BENDS					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	Supply and install the following HDPE PN16 fittings					Spec 4.12.2
5.13.3.1	OD 125 mm Plain ended 90-degree bend	No.	2			Spec 4.12.2
5.13.3.2	OD 125 mm Plain ended 45-degree bend	No.	2			Spec 4.12.2
5.13.3.3	OD 125 mm Plain ended 22.5-degree bend	No.	2			Spec 4.12.2
5.13.4	PLOT OFFTAKE FITTINGS					
5.13.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD 25/20mm farm offtakes	No.	27			Spec 4.12.2
5.13.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	3			Spec 4.18
5.13.5	Junction Chambers					
5.13.5.1	Excavate for, provide all materials and construct complete valve chambers. Internal dimensions 1200 x 1200 x 1200 mm . Rates to include for all thrust blocks , pipe supports, inspection covers, etc as detailed in the drawings.	No.	2			Spec 4.21
	Provide, handle, install and test the following steel (or GI)/HDPE pipes, fittings and valves in the pipeline junctions (Section valve chambers).					
	Rates shall include completion of all pipe joints as specified in the detailed drawings.					
	1 No. Chamber for Sec Pipeline 2-2-1 Offtake on OD125mm section @ ch 1+000					
5.13.5.2	125 / 125 mm dia VJ stepped coupling	No	2			Spec 4.4
5.13.5.3	125 mm dia single flanged steel spigot (0.5 m long)	No	2			Spec 4.6.1
5.13.5.4	125 x 25 mm all flanged steel tee	No	1			Spec 4.3
5.13.5.5	125 mm dia double flanged sluice valve	No.	1			Spec 4.13.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.13.5.6	25 mm dia GI Nipple	No	1			
5.13.5.7	25 mm dia gate valve	No	1			Spec 4.13.1
5.13.5.8	25 mm dia GI union	No	1			
5.13.5.9	25 mm dia 0.5m long single flanged GI piece	No	2			Spec 4.3
5.13.5.10	25 / 32 mm dia GI / HDPE adaptor	No.	1			
	1 No. Chamber for Sec Pipeline 2-2-2 Offtake on OD25mm section @ ch 2+600					
5.13.5.11	25 / 25 mm dia GI / HDPE adaptor	No	3			
5.13.5.12	25 mm dia x 400mm long threaded Steel pipe	No	5			
5.13.5.13	25 x 25 mm GI tee threaded	No	1			
5.13.5.14	25 mm dia GI Nipple	No	2			
5.13.5.15	25 mm dia gate valve	No	2			Spec 4.13.1
5.13.5.16	25 mm dia GI union	No	2			
5.13.6	AIR VALVES					
5.13.6.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	2 No. Single Air Valve (SAV)					Spec 4.15
5.13.6.2	125 / 125 mm dia V/J stepped coupling	No.	4			Spec 4.4

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.13.6.3	125mm, 0.5m long single flanged GI piece	No.	4			Spec 4.3
5.13.6.4	125 x 50 mm double flanged steel tee	No.	2			Spec 4.3
5.13.6.5	50 mm x 400mm long double flanged steel piece	No.	2			Spec 4.3
5.13.6.6	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.13.6.7	50 mm dia Single orifice air valve	No.	2			Spec 4.15
5.13.7	WASHOUTS					
5.13.7.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			
	<i>Provide, handle, install and test the following steel and uPVC pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	2 No. Washout Fittings at chainages shown in the drawings					Spec 5.17
5.13.7.2	125 / 125 mm dia V/J stepped coupling	No.	4			Spec 4.4
5.13.7.3	125mm, 0.5m long single flanged GI piece	No.	4			Spec 4.3
5.13.7.4	125 x 50 mm double flanged steel tee	No.	2			Spec 4.3
5.13.7.5	50 mm flanged gate valve	No.	2			Spec 4.13.1
5.13.7.6	50 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
5.13.7.7	50 / 63 mm dia HDPE / GI adaptor	No.	4			
5.13.7.8	63 mm HDPE PN6 pipe	m	12			
5.13.7.9	50mm dia GI pipe 0.5 m long with flap valve	No.	2			Spec 4.16.1
5.13.8	PRESSURE REGULATING VALVES					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.13.8.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) at Ch 1+940 m					Spec 4.18
5.13.8.2	63 / 50 mm dia VJ stepped coupling	No	2			Spec 4.4
5.13.8.3	50 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
5.13.8.4	50 mm dia GI Nipple	No	1			
5.13.8.5	50 mm dia gate valve for PRV isolation	No	1			Spec 4.18
5.13.8.6	50 mm dia GI union	No	1			
5.13.8.7	Provide and install DN 50mm PRV-43	No.	1			Spec 4.18
5.13.9	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage indicated on drawings					
5.13.9.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1
5.13.10	THRUST BLOCKS					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

5.13.10.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	6			Spec 3.2.3.1
5.13.11	OCCUPATIONAL HEALTH & SAFETY					
5.13.11.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Sub-Main Pipeline 2-2	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No.6 - SECONDARY PIPELINES		
ITEM NO.	DESCRIPTION	AMOUNT (KSh)
	COLLECTION	
1	Bill No. 6.1: Pump SMP2-1 Secondary Pipelines	
2	Bill No. 6.2: Tpump_SMP2-3 Secondary Pipelines	
3	Bill No. 6.3: SMP1-1 Secondary Pipelines	
4	Bill No. 6.4: SMP2-1 Secondary Pipelines	
5	Bill No. 6.5: SMP2-2 Secondary Pipelines	
	TOTAL CARRIED OVER TO GRAND SUMMARY	

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 6.1 - Pump SMP2-1 Sec Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.1.1	Site clearance, Excavation and Backfilling					
6.1.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	2277.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
6.1.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,366			Spec 2.9
6.1.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	273			Spec 2.9
6.1.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	273			Spec 2.9
6.1.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.1.2.1	OD 110 mm HDPE, PN 6.0	m	1360.00			Spec 4.12.1
6.1.2.2	OD 90 mm HDPE, PN 6.0	m	160.00			Spec 4.12.1
6.1.2.3	OD 75 mm HDPE, PN 6.0	m	240.00			Spec 4.12.1
6.1.2.4	OD 50 mm HDPE, PN 6.0	m	146.00			Spec 4.12.1
6.1.2.5	OD 40 mm HDPE, PN 6.0	m	371.00			Spec 4.12.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.1.3	BENDS					
	Supply and Install the following HDPE PN16 fittings					Spec 4.12.2
6.1.3.1	OD110 mm Plain ended 45-degree bend	No.	3			Spec 4.12.2
6.1.3.2	OD110 mm Plain ended 22.5-degree bend	No.	3			Spec 4.12.2
6.1.3.3	OD90 mm Plain ended 45-degree bend	No.	3			Spec 4.12.2
6.1.3.4	OD90 mm Plain ended 22.5-degree bend	No.	3			Spec 4.12.2
6.1.3.5	OD75 mm Plain ended 45-degree bend	No.	3			Spec 4.12.2
6.1.3.6	OD75 mm Plain ended 22.5-degree bend	No.	3			Spec 4.12.2
6.1.4	PLOT OFFTAKE FITTINGS					
6.1.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	23			Spec 4.12.2
6.1.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	6			Spec 4.18
6.1.5	AIR VALVES					
6.1.5.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV) on OD 50mm (Tank SP 2-1-1)					Spec 4.15
						Spec 4.4
6.1.5.2	50 / 40 mm dia V/J stepped coupling	No.	2			
6.1.5.3	40mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.1.5.4	40 x 32 mm double flanged steel tee	No.	1			Spec 4.3

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.1.5.5	32 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
6.1.5.6	32 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.5.7	32 mm dia Single orifice air valve	No.	1			Spec 4.15
	1 No. Single Acting Air Valve (SAV) on OD 110mm (Tank SP2-1-2)					Spec 4.15
6.1.5.8	110 / 100 mm dia V/J stepped coupling	No.	2			
6.1.5.9	100mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.1.5.10	100 x 50 mm double flanged steel tee	No.	1			Spec 4.3
6.1.5.11	50 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
6.1.5.12	50 mm flanged gate valve	No.	1			Spec 4.13.1
6.1.5.13	50 mm dia Single orifice air valve	No.	1			Spec 4.15
6.1.6	WASHOUTS					
6.1.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	2 No. W/O on OD 110mm (Tank SP2-1-1 & Tank SP2-1-2)					
6.1.6.2	110 / 100 mm dia VJ stepped coupling	No.	4			Spec 4.4
6.1.6.3	100 mm dia 0.5m long single flanged	No.	4			Spec 4.3
6.1.6.4	100 x 50 mm dia Level invert scour tee all flanged	No.	2			Spec 4.3

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.1.6.5	50 mm flanged gate valve	No.	2			Spec 4.13.1
6.1.6.6	50 mm dia 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.1.6.7	50 / 63 mm dia HDPE / GI adaptor	No.	4			
6.1.6.8	63 mm HDPE PN6 pipe	m	12			
6.1.6.9	50mm dia GI pipe 0.5 m long with flap valve	No.	2			Spec 4.16.1
6.1.7	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing along Tank SP2-1-2 at Chainage indicated on drawings					
6.1.7.1	Volume of Mass Concrete Class 20/20	m ³	1.05			#REF!
6.1.8	RIVER CROSSINGS FOR PIPES					
	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	River crossing on Tank SP2-1-1 in line with drawings.					
6.1.8.1	Excavation for foundation	m ³	2.69			Spec 2.11
6.1.8.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2
6.1.8.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
6.1.8.4	Provide and fix steel reinforcement	kg	71			Spec 3.2.3.4
6.1.8.5	Provide install flanged DN100mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.8.2
	River crossing on Tank SP2-1-1 in line with drawings.					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.1.8.1	Excavation for foundation	m ³	2.69			Spec 2.11
6.1.8.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2
6.1.8.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
6.1.8.4	Provide and fix steel reinforcement	kg	71			Spec 3.2.3.4
6.1.8.5	Provide install flanged DN40mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.8.2
6.1.9	THRUST BLOCKS					
6.1.9.1	Provide and construct concrete thrust blocks in Class C20/20 concrete at bends, tees, elbows, blank ends, reducers and any other points as detailed in the drawing and or directed by the engineer. Rates to include for excavation and backfilling, concrete, reinforcement and all jointing materials and other fittings as per the specifications.	No.	18			Spec 3.2.3.1
6.1.10	OCCUPATIONAL HEALTH & SAFETY					
6.1.10.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump SMP2-1 Sec Pipelines	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 6.2 - Pump_SMP2-3 Secondary Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.2.1	Site clearance, Excavation and Backfilling					
6.2.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	200.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
6.2.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	120			Spec 2.9
6.2.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	24			Spec 2.9
6.2.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	24			Spec 2.9
6.2.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.2.2.1	OD 50 mm HDPE, PN 6.0	m	200.00			Spec 4.12.1
6.2.3	WASHOUTS					
6.2.3.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No.W/O on OD 50mm (Tank SP2-3-1)					
6.2.3.2	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 4.4
6.2.3.3	40 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.2.3.4	40 mm x 32mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.2.3.5	32 mm flanged gate valve	No.	1			Spec 4.13.1
6.2.3.6	32 mm dia 0.5m long single flanged GI piece	No.	1			Spec 4.3
6.2.3.7	40 / 32 mm dia HDPE / GI adaptor	No.	2			
6.2.3.8	40 mm HDPE PN6 pipe	m	6			
6.2.3.9	32mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
6.2.4	PLOT OFFTAKE FITTINGS					
6.2.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	3			Spec 4.12.2
6.2.5	RIVER CROSSINGS FOR PIPES					
	Provide for river crossings as per drawings and in accordance with specifications. Rates to include for excavation and backfilling, concrete support pillars and all jointing materials and other fittings as per the specifications.					
	River crossing on Tank SP2-3-1 in line with drawings.					
6.2.5.1	Excavation for foundation	m ³	2.69			Spec 2.11
6.2.5.2	Provide, place blinding concrete C15	m ³	0.05			Spec 3.2.3.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.2.5.3	C25 Concrete to bases and columns	m ³	0.75			Spec 3.2.3.3
6.2.5.4	Provie and fix steel reinforcement	kg	71			Spec 3.2.3.4
6.2.5.5	Provide install flanged DN40mm PN16 epoxy coated steel pipe including fittings and jointing in line with drawings	m	6			Spec 4.8.2
6.2.6	OCCUPATIONAL HEALTH & SAFETY					
6.2.6.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for Pump SMP2-3 Sec Pipelines	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 6.3 - SMP1-1 Distribution Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.3.1	Site clearance, Excavation and Backfilling					
6.3.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	416.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
6.3.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	250			Spec 2.9
6.3.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	50			Spec 2.9
6.3.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	50			Spec 2.9
6.3.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.3.2.1	OD 32 mm HDPE, PN 6.0	m	416.00			Spec 4.12.1
6.3.3	PRESSURE REGULATING VALVES					
6.3.3.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	2			Spec 2.11

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	2 No. Pressure Regulator Valve (PRV) for SP1-1-1 & SP1-1-2					Spec 4.18
6.3.3.2	32 / 25 mm dia GI / HDPE adaptor	No	4			
6.3.3.3	25 mm dia single flanged GI pipe (500mm)	No.	4			Spec 4.3
6.3.3.4	25 mm dia GI Nipple	No	2			
6.3.3.5	25 mm dia gate valve for PRV isolation	No	2			Spec 4.18
6.3.3.6	25 mm dia GI union	No	2			
6.3.3.7	Provide and install DN 25mm PRV-23 and PRV-25	No.	2			Spec 4.18
6.3.4	PLOT OFFTAKE FITTINGS					
6.3.4.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD20mm farm offtakes	No.	7			Spec 4.12.2
6.3.4.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	1			
6.3.5	OCCUPATIONAL HEALTH & SAFETY					
6.3.5.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for SMP1-1 Distribution Pipelines	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 6.4 - SMP2-1 Distribution_ Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.4.1	Site clearance, Excavation and Backfilling					
6.4.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	2979.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
6.4.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	1,787			Spec 2.9
6.4.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	357			Spec 2.9
6.4.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	179			Spec 2.9
6.4.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.4.2.1	OD 63 mm HDPE, PN 6.0	m	540.00			Spec 4.12.1
6.4.2.2	OD 50 mm HDPE, PN 6.0	m	1320.00			Spec 4.12.1
6.4.2.3	OD 40 mm HDPE, PN 6.0	m	740.00			Spec 4.12.1
6.4.2.4	OD 32 mm HDPE, PN 6.0	m	379.00			Spec 4.12.1
6.4.3	PLOT OFFTAKE FITTINGS					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.4.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc for OD25/20mm farm offtakes	No.	30			Spec 4.12.2
6.4.3.2	Provide and install DN 25/20 mm pressure reducing valves (PRVs) at farm level including related fittings as instructed by the Engineer	No.	1			Spec 4.18
6.4.4	AIR VALVES					
6.4.4.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV) on OD 50mm for SP2-1-2					Spec 4.15
6.4.4.2	50 / 40 mm dia V/J stepped coupling	No.	2			Spec 4.4
6.4.4.3	40mm, 0.5m long single flanged GI piece	No.	2			Spec 4.3
6.4.4.4	40 x 32 mm double flanged steel tee	No.	1			Spec 4.3
6.4.4.5	32 mm x 400mm long double flanged steel piece	No.	1			Spec 4.3
6.4.4.6	32 mm flanged gate valve	No.	1			Spec 4.13.1
6.4.4.7	32 mm dia Single orifice air valve	No.	1			Spec 4.15
6.4.5	WASHOUTS					
6.4.5.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 600 x 600 x 600 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

	1 No.W/O on OD 50mm (SP2-1-2)					
6.4.5.2	50 / 40 mm dia VJ stepped coupling	No.	2			Spec 4.4
6.4.5.3	40 mm dia single flanged GI piece (500mm long)	No.	2			Spec 4.3
6.4.5.4	40 mm x 32mm level invert scour GI tee with flanged branch	No.	1			Spec 4.3
6.4.5.5	32 mm flanged gate valve	No.	1			Spec 4.13.1
6.4.5.6	Spec 4.3	No.	1			Spec 4.3
6.4.5.7	40 / 32 mm dia HDPE / GI adaptor	No.	2			
6.4.5.8	40 mm HDPE PN6 pipe	m	6			
6.4.5.9	32mm dia GI pipe 0.5 m long with flap valve	No.	1			Spec 4.16.1
6.4.6	PRESSURE REGULATING VALVES					
6.4.6.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	5			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	3 No. Pressure Regulator Valves (PRV) as shown in drawings					Spec 4.18
6.4.6.2	50 / 40 mm dia VJ stepped coupling	No	6			Spec 4.4
6.4.6.3	40 mm dia single flanged GI pipe (500mm)	No.	6			Spec 4.3
6.4.6.4	40 mm dia GI Nipple	No	3			
6.4.6.5	40 mm dia gate valve for PRV isolation	No	3			Spec 4.18
6.4.6.6	40 mm dia GI union	No	3			

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.4.6.7	Provide and install DN 40mm PRV-25, PRV-26, and PRV-28	No.	3			Spec 4.18
	1 No. Pressure Regulator Valve (PRV) along SP2-1-1 as shown in drawings					Spec 4.18
6.4.6.8	40 / 32 mm dia HDPE / GI adaptor	No	2			
6.4.6.9	32 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
6.4.6.10	32 mm dia GI Nipple	No	1			
6.4.6.11	32 mm dia gate valve for PRV isolation	No	1			Spec 4.18
6.4.6.12	32 mm dia GI union	No	1			
6.4.6.13	Provide and install DN 32mm PRV-27	No.	1			Spec 4.18
	1 No. Pressure Regulator Valve (PRV) along Sp2-1-2 shown in drawings					Spec 4.18
6.4.6.14	63 / 50 mm dia VJ stepped coupling	No	2			Spec 4.4
6.4.6.15	50 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
6.4.6.16	50 mm dia GI Nipple	No	1			
6.4.6.17	50 mm dia gate valve for PRV isolation	No	1			Spec 4.18
6.4.6.18	50 mm dia GI union	No	1			
6.4.6.19	Provide and install DN 50mm PRV-23	No.	1			Spec 4.18
6.4.7	ROAD CROSSINGS FOR PIPES					
	Provide all materials and labour for the construction of Concrete Encasement for the Road Crossings. The Rates include all Excavation, Backfilling and compaction works.					Spec 2.22
	1 No. Minor Road Crossing at Chainage indicated on drawings					
6.4.7.1	Volume of Mass Concrete Class 20/20	m ³	1.05			Spec 3.2.3.1

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.4.7	OCCUPATIONAL HEALTH & SAFETY					
6.4.7.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for SMP2-1 Distribution_ Pipelines	Lumpsum	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 6.5 - SMP2-2 Distribution Pipelines						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
6.5.1	Site clearance, Excavation and Backfilling					
6.5.1.1	Clear site of all trees (less than 500 mm diameter), bushes, shrubs, etc and dispose in accordance with specifications.	m ²	440.00			Spec 2.2
	<i>Rates for excavation and backfilling in trench shall include for trimming trench bottom, providing bedding materials and surround and reinstatement of the site.</i>					
6.5.1.2	Excavation and backfilling in normal material pipeline for depth not exceeding 1.5 m	m ³	264			Spec 2.9
6.5.1.3	Excavation and backfilling trench in soft rock for depth not exceeding 1.5m	m ³	40			Spec 2.9
6.5.1.4	Excavation and backfilling in trench hard rock material for pipeline for depth not exceeding 1.5 m	m ³	26			Spec 2.9
6.5.2	HDPE Pipe work					
	<i>Provide, lay, joint and test the following HDPE pipe and fittings. Rates to include for all jointing materials, cutting, wastage and anchorage.</i>					Spec 4.12.2
	STRAIGHTS					
6.5.2.2	OD 32 mm HDPE, PN 6.0	m	260.00			Spec 4.12.1
6.5.2.3	OD 25 mm HDPE, PN 6.0	m	180.00			Spec 4.12.1
6.5.3	PLOT OFFTAKE FITTINGS					
6.5.3.1	Provide all necessary Tees, Reducers, Adaptors, Valves, stubs, etc. for OD25/20mm farm offtakes	No.	5			Spec 4.12.2

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.5.4	AIR VALVES					
6.5.4.1	Excavate, provide all materials and construct complete inspection valve chambers of internal dimensions 1200 x 1200 x 1000 mm at the pipe junctions. Rates to including for thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes and fittings and valves. Rates shall include for completing all pipe jointings as per the specifications.</i>					
	1 No. Single Acting Air Valve (SAV) along SP2-2-1					Spec 4.15
6.5.4.2	32 / 25 mm dia HDPE adaptor	No.	2			
6.5.4.3	25 mm dia x 500mm long threaded Steel pipe	No.	3			
6.5.4.4	25 mm x 25 mm dia GI tee threaded	No.	1			
6.5.4.5	25 mm flanged gate valve	No.	1			
6.5.4.6	25 mm single orifice air valve	No.	1			Spec 4.15
6.5.5	PRESSURE REGULATING VALVES					
6.5.5.1	Excavate, provide all materials and construct complete w/o chambers of internal dimensions 1500 x 1500 x 1200 mm. Rates to including thrust blocks and pipe supports as shown in the drawings.	No.	1			Spec 2.11
	<i>Provide, handle, install and test the following steel and HDPE pipes, fittings and valves. Rates shall include for completion and pipe protection at all pipe joints as specified in specifications and drawings</i>					
	1 No. Pressure Regulator Valve (PRV) for SP2-2-2					Spec 4.18
6.5.5.2	25 / 20 mm dia GI / HDPE adaptor	No	2			
6.5.5.3	20 mm dia single flanged GI pipe (500mm)	No.	2			Spec 4.3
6.5.5.4	20 mm dia GI Nipple	No	1			

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

6.5.5.5	20 mm dia gate valve for PRV isolation	No	1			Spec 4.18
6.5.5.6	20 mm dia GI union	No	1			
6.5.5.7	Provide and install DN 20mm PRV-22	No.	1			Spec 4.18
6.5.6	OCCUPATIONAL HEALTH & SAFETY					
6.5.6.1	Provide Sufficient PPEs, first aid tools, traffic management, community H&S plan during the Site Clearance, Excavations, Backfilling, Laying & Fittings for SMP2-2 Distribution Pipelines	Lumpsu m	1			Spec 8.5
	TOTAL CARRIED OVER TO GRAND SUMMARY					

UNPRICED BILL OF QUANTITIES FOR KABUGI IRRIGATION PROJECT

Bill No. 7 - Plot Hydrant						
ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (KSh)	AMOUNT (KSh)	Technical Specifications Ref.
	Scheme Plots	No.	321			
7.1	Plot Hydrants					
7.1.1	25 mm dia HDPE/GI adaptor	No.	642			
7.1.2	25 mm dia GI elbow	No.	1284			
7.1.3	25 mm dia GI straight threaded on both sides 1000 mm long	No.	642			
7.1.4	25 mm dia GI nipple	No.	1605			
7.1.5	25 mm dia gate valve	No.	321			Spec 4.13.1
7.1.6	25x 20 mm dia GI tee	No.	321			
7.1.7	25/20 mm dia plug	No.	321			
7.1.8	25mm dia GI union	No.	321			
	TOTAL CARRIED OVER TO COLLECTION SHEET					